

AMENDMENTS TO THE CLAIMS

Applicant submits below a complete listing of the current claims, including marked-up claims with insertions indicated by underlining and deletions indicated by strikeouts and/or double bracketing. This listing of claims replaces all prior versions, and listings, of claims in the application:

Listing of the Claims

1. (Currently amended) A device, comprising:
a single-crystal layer of a first semiconductor material comprising, the single-crystal layer of the first semiconductor material including a plurality of single-crystal nanostructures of a second semiconductor material, wherein the plurality of single-crystal nanostructures ~~single-crystal~~ are distributed according to a regular centered tetragonal mesh crystal lattice.
2. (Currently amended) The ~~layer~~ device of claim 1, wherein the first semiconductor material is silicon and the second semiconductor material is germanium.
3. (Currently amended) The ~~layer device~~ of claim 2, wherein ~~the~~ a height of the tetragonal mesh is equal to a sum of two equal elementary values selected from a range of from 60% to 80% ~~of the nanostructure~~ an average diameter of the plurality of nanostructures up to four times the average diameter of the plurality of nanostructures.
4. (Currently amended) The ~~layer device~~ of claim 2, wherein a planar base of the regular centered tetragonal mesh is substantially square and exhibits a side ~~of a~~ value ranging between approximately 50 nm and approximately 300 nm.
5. (Currently amended) A light source, comprising the ~~layer device~~ of claim 1 associated with an electric excitation circuit.

6. (Original) The source of claim 5, forming a coherent source.
7. (Original) The source of claim 5, forming a diode.
8. (Currently amended) A light-trapping device, comprising the ~~layer~~ device of claim 1.
9. (Original) A photodetector, comprising the device of claim 8.
10. (Currently amended) A diffractor of a light or acoustic wave, comprising the ~~layer~~ device of claim 1.
11. (Currently amended) An optical or acoustic filter, comprising the ~~layer~~ device of claim 1.
12. (New) A semiconductor device, comprising:
a single-crystal layer of a first semiconductor material; and
a plurality of single-crystal nanostructures of a second semiconductor material, the plurality of nanostructures of the second semiconductor material being encapsulated in the layer of the first semiconductor material, wherein the plurality of nanostructures of the second semiconductor material are distributed according to a regular centered tetragonal mesh lattice.
13. (New) The device of claim 12, wherein the first semiconductor material is silicon and the second semiconductor material is germanium.
14. (New) The device of claim 12, wherein a height of the tetragonal mesh approximates a sum of two approximately equal elementary thicknesses selected from a range of from approximately 60% to approximately 80% of a diameter of a nanostructure to approximately four times the diameter of the nanostructure.

15. (New) The device of claim 12, wherein the regular centered tetragonal mesh comprises a substantially square base, the substantially square base exhibiting a side dimension ranging between approximately 50 nm and approximately 300 nm.

16. (New) The device of claim 12, wherein the plurality of nanostructures comprise quantum dots.

17. (New) A semiconductor device, comprising:

- a first plurality of nanostructures formed from a first semiconductor material encapsulating a second semiconductor material;

- a second plurality of nanostructures formed from the first semiconductor material encapsulating the second semiconductor material; and

- a third plurality of nanostructures formed from the first semiconductor material encapsulating the second semiconductor material, wherein the first plurality of nanostructures are laterally equidistant from the second plurality of nanostructures, and the second plurality of nanostructures are laterally equidistant from the third plurality of nanostructures.

18. (New) The device of claim 17, wherein the first plurality of nanostructures is disposed in a first layer that is vertically spaced from a second layer, the second layer comprising the second plurality of nanostructures.

19. (New) The device of claim 17, wherein the first plurality of nanostructures have an average diameter ranging between approximately 40 nm and approximately 200 nm.

20. (New) The device of claim 17, wherein the first plurality of nanostructures have an average height ranging between approximately 10 nm and approximately 30 nm.

21. (New) The device of claim 17, wherein the first semiconductor material is silicon and the second semiconductor material is germanium.

22. (New) A semiconductor device, comprising:
a substrate; and
a pseudo-substrate disposed adjacent to the substrate, the pseudo-substrate comprising:
a plurality of planes, the plurality of planes including a plurality of nanostructures disposed within each plane; and
a heteroatomic layer disposed adjacent to the plurality of planes.

23. (New) The device of claim 22, wherein the substrate comprises single-crystal silicon.

24. (New) The device of claim 22, wherein the plurality of nanostructures comprises germanium nanostructures encapsulated within silicon.

25. (New) The device of claim 22, further comprising a silicon layer disposed adjacent to the pseudo-substrate.

26. (New) The device of claim 22, wherein the heteroatomic layer comprises a silicon germanium layer.

27. (New) The device of claim 22, wherein the plurality of planes comprises a density of defects approximately between $10/\text{cm}^2$ to $10^3/\text{cm}^2$.